PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application

Applicant: JOSEPH HUMMEL

Serial No.: 08/424,223 Art. Unit: 3503

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Docket No.: 10-142C3

Title: KNITTABLE YARN AND SAFETY APPAREL

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SUPPLEMENTAL RULE 132 DECLARATION

Now comes Joseph Hummel, the above named applicant, who states as follows:

1. The facts set forth herein supplement those set forth in my declaration dated April 13, 1995 submitted in the above-identified application and are provided to answer or clarify the facts previously attested to with respect to which the examiner has raised questions.

2. The core strands of the yarns identified in paragraph 2 of the April 13 declaration and for which test results are set forth in Exhibit A of that declaration were essentially parallel. The wrapping strands were wound 10 turns per inch. The first wrapping was clockwise and the second counterclockwise. Insofar as I am aware, there is no significance to which direction the first or second wrappings are wound as long as they are wound in opposite directions. The test results set forth in the third column of Exhibit A are for yarns of a construction sensibly identical to the construction

of the yarns described in the first column of Exhibit A, except for the presence of a core strand of stainless steel wire .002 inch in diameter in the yarns described in the third column.

3. The test results set forth in Exhibit B of the April 13 declaration represent the test results in Exhibit A, mathematically adjusted to represent the cut-resistance value of such constructions made of fiber strands of equal (1000) denier. Strands or yarns of the different materials were not available in identical deniers. Further, multiple strands of lesser denier combined into larger total deniers do not accurately equate in cut-resistance to single strands of the same denier, in my experience. The average slash weights of Exhibit B were mathematically adjusted by subtracting the value of the denier that was less than 1000 from 1000 and adding that difference divided by 1000 as a percent increase to the slash weight of the yarn of lower denier. Such an adjustment is overly conservative.

4. Exhibit C attached hereto is in all respects identical to Exhibit B, except that the adjustment of the slash weight was made on the mathematical basis of the percent increase that a 1000 denier yarn represents over the lower denier actually tested. Thus, a yarn of 1000 denier is approximately 50% greater than a yarn of 650 denier, and the slash weight of the 650 denier yarn is multiplied by 1000/650 or 1.54 to determine the equivalent cut-resistance. The mathematically adjusted results of either Exhibit B or Exhibit C, or the unadjusted results of Exhibit A, all support the facts and conclusions set forth in paragraph 9 of the April 13 declaration.

5. The reasons for the specific tests, rather than the tests suggested by the examiner at the top of page 5 of the Office action mailed August 18, 1995, were that these tests show the results of using the different high performance fibers alone for core and wraps, the use of different high performance fibers in the core and one wrap in combination with a wire core strand, and in the

core and both wraps in combination with a wire core strand. Thus, the effect of the wire core and the difference between one and two wraps of high performance fiber can be seen. For example, the tests show that with or without a wire core strand, the contribution of the high performance fibers is significant and differs for the various fibers. The purpose of the tests was to show the effect of a use of Vectran M, and to compare its effect with that of known cut-resistant fibers, not to merely compare specific elected species having different fibers, because then the cut-resistance of the high performance fibers per se and the contributions of the high performance fibers vis-a-vis the other components would not be apparent. For example, comparing yarns 1849 and 1845 with yarns 1850 and 1847, these test show the surprising result that Vectran M (a lower tenacity than Spectra) had much greater cut-resistance than Spectra when all elements of the yarn were limited to the fibers. Consistent with that, when the core strand in each was removed in favor of stainless steel, known for its high cut-resistance, and one of the high cut-resistant wraps was removed in favor of the lower cut-resistant polyester, the difference between the Spectra yarn and the Vectran M yarn was less. The fact that the cut-resistance of the Vectran M yarn went down with the change while that of the Spectra yarn went up underscores the surprisingly higher cut-resistant contribution of the Vectran M over the Spectra. That is, the addition of a wire core element more than offset the removal of one wrap of Spectra replaced by polyester, while the same substitution for Vectran M reduced cut-resistance. The fact that the same substitution in the case of Kevlar also reduced the cut-resistance, while in the case of Vectran HS it increased cut-resistance, underscores the lack of predictability and obviousness.

6. The tightness of the knit of the various samples tested was the same. While a fabric knit from a higher

denier yarn would normally have a greater density than a fabric knitted from a lesser denier yarn, the knitting of the samples tested was adjusted to provide essentially the same yarn weight (ounces per square yard) for all.

7. While the yarns tested had different constituents and deniers, this was necessary. The constituents differed because the tests were to show the difference among different constituents, i.e., different cut-resistant fibers. The deniers differed because the different fibers are not available in identical deniers. The results were mathematically adjusted to avoid provide a comparison that was distorted by the difference in deniers, although even with the distortion, the tests revealed the unexpected cut-resistance of Vectran M.

I hereby declare that all statement made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issued thereon.

Dated: 12/22/95, 1995

Joseph Hummel

Sworn to before me and subscribed in my presence this 22nd day of December, 1995.

Notary Public

WANDA A. DALTON, NOTARY PUBLIC
STATE OF OHIO, HURON COUNTY
MY COMMISSION EXPIRES MARCH 28, 1997

CUT COMPARISON VEC M VS HS

JH 12/15/95

YARN#	YARN CONSTRUCTION	AVG SLASH (LB)	YARN#	YARN CONSTRUCTION	AVG SLASH (LB)	YARN#	YARN CONSTRUCTION	AVG SLASH (LB)
1848	650 D POLYESTER- CORE 1ST- 650 D POLYESTER 2ND- 650 D POLYESTER	6.78*	1842	650 D POLYESTER .002 SS- CORE 1ST- 650 D POLYESTER 2ND- 650 D POLYESTER	7.95*	1842	650 D POLYESTER .002 SS- CORE 1ST- 650 D POLYESTER 2ND- 650 D POLYESTER	7.95*
1849	650 D SPECTRA- CORE 1ST- 650 D SPECTRA 2ND- 650 D SPECTRA	7.78*	1845	650 D SPECTRA .002 SS- CORE 1ST- 650 D SPECTRA 2ND- 650 D POLYESTER	13.18*	1844	650 D SPECTRA .002 SS- CORE 1ST- 650 D SPECTRA 2ND- 650 D SPECTRA	15.12*
1852	1000 D KEVLAR- CORE 1ST- 1000 D KEVLAR 2ND- 1000 D KEVLAR	14.42	1843	1000 D KEVLAR .002 SS- CORE 1ST- 1000 D KEVLAR 2ND- 1000 D POLYESTER	10.73	1851	1000 D KEVLAR .002 SS- CORE 1ST- 1000 D KEVLAR 2ND- 1000 D KEVLAR	14.12
1850	750 D VECTRAN M- CORE 1ST- 750 D VECTRAN M 2ND- 750 D VECTRAN M	10.56*	1847	750 D VECTRAN M .002 SS- CORE 1ST- 750 D VECTRAN M 2ND- 650 D POLYESTER	10.05*	1846	750 D VECTRAN M .002 SS- CORE 1ST- 750 D VECTRAN M 2ND- 750 D VECTRAN M	11.87*
1964	750 D VECTRAN HS- CORE 1ST- 750 D VECTRAN HS 2ND- 750 D VECTRAN HS	10.92*	1863	750 D VECTRAN HS .002 SS- CORE 1ST- 750 D VECTRAN HS 2ND- 650 D POLYESTER	12.96*	1862	750 D VECTRAN HS .002 SS- CORE 1ST- 750 D VECTRAN HS 2ND- 750 D VECTRAN HS	13.93*

* ADJUSTED UP TO 1000 DENIER

Exhibit C